



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/786,856	02/24/2004	Fuyun Ling	010104C1	3630

23696 7590 01/04/2007  
QUALCOMM INCORPORATED  
5775 MOREHOUSE DR.  
SAN DIEGO, CA 92121

EXAMINER
----------

PHU, PHUONG M

ART UNIT	PAPER NUMBER
----------	--------------

2611

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	01/04/2007	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 01/04/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

us-docketing@qualcomm.com  
kscanla@qualcomm.com  
t\_ssadik@qualcomm.com

## Office Action Summary

Application No.

10/786,856

Applicant(s)

LING ET AL.

Examiner

Phuong Phu

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 2/24/04.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Information Disclosure Statement*

1. Regarding the IDS filed on 2/24/04, references, corresponding to Ref No. B4, B5-B7 and C4-C6, are not initialed by the examiner because the Office has not received copies of theses references.

### *Double Patenting*

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-3 and 7 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,771,706. Although the conflicting claims are not identical, they are not patentably distinct from each other because the limitations of claims 1-3 and 7 are encompassed by claim 1 of U.S. Patent No. 6,771,706.

4. Claim 5 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 14 of U.S. Patent No. 6,771,706. Although the conflicting claims

Art Unit: 2611

are not identical, they are not patentably distinct from each other because the limitations of claim 5 is encompassed by claim 14 of U.S. Patent No. 6,771,706.

5. Claim 8 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 2 of U.S. Patent No. 6,771,706. Although the conflicting claims are not identical, they are not patentably distinct from each other because the limitations of claim 8 is encompassed by claim 2 of U.S. Patent No. 6,771,706.

6. Claim 6 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 22 of U.S. Patent No. 6,771,706. Although the conflicting claims are not identical, they are not patentably distinct from each other because the limitations of claim 6 is encompassed by claim 22 of U.S. Patent No. 6,771,706.

7. Claim 4 is rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 8 of U.S. Patent No. 6,771,706 in view of claim 3 of said U.S. Patent.

-Regarding to claim 4, claim 8 of U.S. Patent No. 6,771,706 discloses the claimed limitations except that claim 8 fails to teach the limitation "at the transmitter unit, preconditioning modulation symbols prior to transmission to the receiver unit in accordance with characterizations for the plurality of transmission channels". However, claim 8 teaches that the transmitter includes preconditioning the modulation symbols prior to transmission the receiver unit based on the eigenmodes, indicated by the reported CSI (see also claim 4 which claim 8 depends on). In addition claim 3 teaches that the reported CSI comprises characterizations for the plurality of transmission channel. It would have been obvious for one skilled in the art to implement invention of claim 8, such that the eigenmodes, indicated by the reported CSI which

Art Unit: 2611

comprises characterizations for the plurality of transmission channel, as suggested by claim 3. With such the implementation, claim 8 in view of claim 3 teaches the limitation “at the transmitter unit, pre-conditioning modulation symbols prior to transmission to the receiver unit in accordance with characterizations for the plurality of transmission channels”.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1-8 are rejected under 35 U.S.C. 102(e) as being anticipated by Ling et al (6,961,388)

-Regarding to claim 1, see figure 1, col. 3, line 24 to col. 4, line 67, col. 8, lines 8 to col. 9, line 35, Ling et al discloses a method (see figure 1) for transmitting data from a transmitter unit (110) to a receiver unit (150) in a multiple-input multiple-output (MIMO) communication system, comprising:  
at the receiver unit:

procedure (152a,...,152r) of receiving a plurality of signals via a plurality of receive antennas (152a,...,152r), wherein the received signal from each receive antenna comprises a combination of one or more signals transmitted from the transmitter unit (see col. 3, line 24 to col. 4, line 67),

Art Unit: 2611

procedure (150) of processing the plurality of received signals to provide estimates of modulation symbols transmitted from the transmitter unit (see col. 3, line 24 to col. 4, line 67),

procedure (150) estimating signal-to-noise-plus-interference (SNR) of a plurality of transmission channels used for data transmission (see col. 8, lines 22-31), and

procedure (150) of transmitting SNR estimates for the transmission channels back to the transmitter unit (see col. 8, lines 22-31); and  
at the transmitter unit:

procedure (110) processing data for transmission to the receiver unit in accordance with the received SNR estimates (see col. 8, line 47 to col. 9, line 22).

-Regarding to claim 2, Ling et al discloses that the SNR of each of the plurality of transmission channels is estimated, and the SNR estimates for each transmission channel is transmitted back to the transmitter unit (see col. 8, lines 22-31).

-Regarding to claim 3, Ling et al discloses, at the receiver unit, procedure (110) of deriving characterizations of SNRs as link characteristics for the plurality of transmission channels used for data transmission, and transmitting the characterizations back to the transmitter unit (see col. 6, lines 45-49, col. 8, lines 1-7, lines 21-46, col. 17, lines 1-19).

-Regarding to claim 4, Ling et al discloses, at the transmitter unit, procedure (110) of pre-conditioning modulation symbols prior to transmission to the receiver unit in accordance with characterizations for the plurality of transmission channels (see col. 7, lines 18-67).

-Regarding to claim 5, Ling et al discloses that the received modulation symbols are processed in accordance with a channel correlation matrix inversion (CCMI) scheme (see col. 8, lines 32-36).

Art Unit: 2611

-Regarding to claim 6, Ling et al discloses that the received modulation symbols are processed in accordance with a MSE scheme “MMSE”, considered here equivalent with the limitation “minimum unbiased mean square error (UMMSE) scheme”, (see col. 8, lines 32-36).

-Regarding to claim 7, Ling et al discloses that the processing at the transmitter unit includes procedure (110) of coding data for each transmission channel in accordance with the received SNR estimate for the transmission channel (see col. 12, lines 10-13).

-Regarding to claim 8, Ling et al discloses procedure of modulating coded data for each transmission channel based on a modulation scheme selected based on the received SNR estimate for the transmission channel (see col. 12, lines 24-35).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phuong Phu whose telephone number is 571-272-3009. The examiner can normally be reached on M-F (8:00 AM - 4:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2611

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Phuong Phu  
11/16/08

**PHUONG PHU**  
**PRIMARY EXAMINER**

Phuong Phu  
Primary Examiner  
Art Unit 2611